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United States Patent [19]**Buncke**[11] **Patent Number:** **5,931,855**[45] **Date of Patent:** **Aug. 3, 1999**[54] **SURGICAL METHODS USING ONE-WAY SUTURE**[75] **Inventor:** **Harry J. Buncke**, Hillsborough, Calif.[73] **Assignee:** **Frank Hoffman**, Hillsborough, Calif.; a part interest[21] **Appl. No.:** **08/859,887**[22] **Filed:** **May 21, 1997**[51] **Int. Cl.⁶** **A61B 17/04**[52] **U.S. Cl.** **606/228; 606/215; 606/224; 606/216**[58] **Field of Search** **606/224-228, 606/215-216**[56] **References Cited****U.S. PATENT DOCUMENTS**

3,123,077	3/1964	Alcamo	606/224
5,123,913	6/1992	Wilk et al.	606/232
5,222,976	6/1993	Yoon	606/223
5,425,746	6/1995	Proto et al.	606/224
5,425,747	6/1995	Brotz	606/224
5,450,860	9/1995	O'Connor	128/898
5,584,859	12/1996	Brotz	606/224

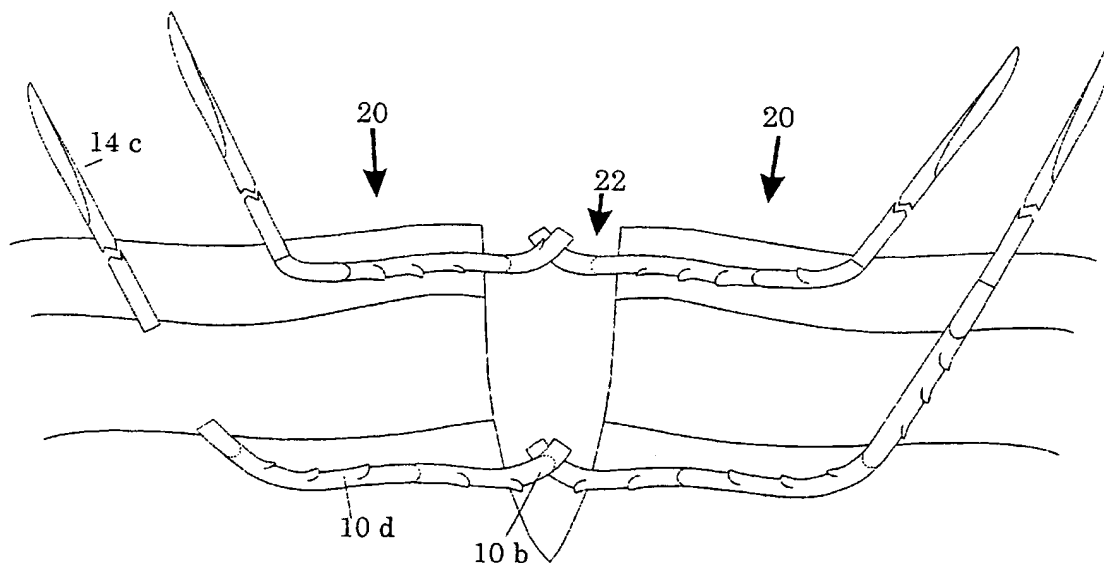
OTHER PUBLICATIONS

H. Han, et al. "Mating and Piercing Micromechanical Structures for Surface Bonding Applications".
Micro ElectroMechanical Systems (MEMS-91), Jan. 31-Feb. 2, 1991, CH2957-Sep. 1991, pp. 253-258, 1991.

H. Buncke, et al. "The Suture Repair of One-Millimeter Vessels". *Micro-Vascular Surgery*, pp. 24-35 (esp. p. 34), 1966.

Primary Examiner—Gary Jackson*Attorney, Agent, or Firm*—Thomas M. Freiburger[57] **ABSTRACT**

Methods are disclosed for binding together human or animal tissue using one-way sutures having barbs on their exterior surfaces, allowing passage of a needle-drawn suture in one direction through tissue, but not in the opposite direction. In closing a wound, the sutures are passed through tissue at each of the opposed sides of the wound, forming suture pairs in which trailing ends of the sutures are juxtaposed in the wound. The number of suture pairs is selected in accordance with the size of the wound. The wound is closed and ends of the sutures of each suture pair are secured together, which may be by heat bonding or surgical knots. In a variation of this procedure double-armed sutures are used. In another variation detachable needles are used to leave the barbed sutures below the skin. The invention avoids loop stitching, minimizing scarring. In addition to wounds at the skin surface, the method is useful in binding together severed tendons or other internal tissue of a patient, providing considerable tensile strength with a minimum of suturing and locating the tensile support precisely where needed. In facelifts and other cosmetic operations, the sutures are used to provide lines of tissue support beneath the skin.

27 Claims, 9 Drawing Sheets

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